

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

Sub A >

1. An epitaxial zinc-based II-VI semiconductor film grown using single source chemical vapour deposition.
2. An epitaxial film as claimed in claim 1, wherein 5 the epitaxial film comprises ZnS.
3. An epitaxial film as claimed in claim 2, wherein the ZnS is grown using zinc diethyldithiocarbamate as precursor for the single source chemical vapour deposition.
4. An epitaxial film as claimed in claim 2, wherein 10 the ZnS is grown using $Zn(S_2CNR_2)_2$, where R comprises an alkyl group, as a precursor for the single source chemical vapour deposition.
5. A process as claimed in claim 4, wherein the 15 number of carbon atoms in the alkyl group is in the range from 1 to 6.
6. A process comprising the steps of utilising single source chemical vapour deposition for growing an epitaxial zinc-based II-VI semiconductor film on a substrate.
7. A process as claimed in claim 6, wherein the 20 epitaxial film comprises ZnS.
8. A process as claimed in claim 7, wherein the process comprises the use of $Zn(S_2CNR_2)_2$, where R comprises an alkyl group, as a precursor for the single source 25 chemical vapour deposition.
9. A process as claimed in claim 8, wherein the number of carbon atoms in the alkyl group is in the range from 1 to 6.
10. A process as claimed in claim 7, wherein the 30 process comprises the use of zinc diethyldithiocarbamate as a precursor for the single source chemical vapour deposition.
11. A process as claimed in any one of claims 6 to 10, wherein the substrate comprises a silicon (111) 35 substrate.

Sub B >

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12. A substrate coated with a coating comprising an epitaxial zinc-based II-VI semiconductor film grown using single source chemical vapour deposition.

13. A substrate as claimed in claim 12, wherein the 5 substrate comprises silicon (111).

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14. A substrate as claimed in claims 12 or 13, wherein the epitaxial film comprises ZnS.

Sub B₂

15. A process for growing an epitaxial zinc-based II-VI semiconductor film, the process comprising the steps of:

10 - cleaning a substrate,

- heating the substrate to a deposition temperature,

- the sublimation of a single source chemical vapour deposition precursor;

- the pyrolysis of the precursor molecules on the 15 heated substrate; and

- the formation of the epitaxial film on the heated substrate.

16. A process as claimed in claim 15, wherein the substrate comprises silicon (111).

20 17. A process as claimed in claim 15 or 16, wherein the epitaxial film comprises ZnS.